

Access this article online

Quick Response Code:



Website:

www.ajts.org

DOI:

10.4103/ajts.AJTS_68_19

Adding further evidence for clinically significant anti-Le^b antibody in a voluntary blood donor

Gita Negi, Sheetal Malhotra¹, Sushant Kumar Meinia, Daljit Kaur, Divya Rai²

Abstract:

Herein, we report a case of naturally occurring anti-Le^b alloantibody identified in the plasma of a first time voluntary blood donor. The immunohematology workup was done on the pilot sample tubes collected during blood donation by the conventional tube technique and using ID-Micro Column System Glass Beads card (anti-IgG, C₃d; Ortho-Clinical Diagnostics, Raritan, New Jersey, USA). Blood group of the donor was confirmed to be B RhD positive, and the alloantibody in his plasma was identified as anti-Le^b, having clinically significant characteristics. Since in this particular case, anti-Le^b was IgM and IgG in nature, it was clinically significant and can lead to hemolytic transfusion reaction, especially if such fresh frozen plasma unit is transfused to Le^b negative patients.

Keywords:

Anti-Le^b antibody, blood donor, hemolytic transfusion reaction

Introduction

Antibodies to the Lewis blood group antigens are primarily formed as naturally occurring IgM immunoglobulin, sometimes, however, may have an IgG component with a few rare examples of IgG type.^[1-3] They most often occur in the sera of Le (a-b-) individuals and may contain a mixture of anti-Le^a, anti-Le^b, and anti-Le^{ab} (an antibody capable of recognizing both Le (a+) and Le (b+) on the red blood cells (RBCs)).^[1] Anti Lewis antibodies rarely cause acute hemolytic transfusion reactions since they usually do not react at 37°C. In addition, transfused RBCs often lose their Lewis antigens into the recipient's plasma.^[4] Furthermore, the Lewis antigens being present as the blood plasma antigen, the antibody in the recipient, if present, gets neutralized before reacting with the transfused

RBCs.^[4] Herein we report a case of naturally occurring anti-Le^b alloantibody identified in the plasma of a first time voluntary blood donor.

Materials and Methods

The blood group of the donor was done by the conventional tube technique (CTT) on the pilot sample tubes collected during blood donation. Further immunohematology (IH) workup included direct and indirect antiglobulin tests with polyspecific antihuman globulin (AHG-IgG+C3d) performed by CTT as well as by column agglutination technique (CAT) using ID Micro Column System Glass Beads card (anti IgG, C3 d; Ortho-Clinical Diagnostics, Raritan, New Jersey, USA).

His blood sample was sent to the reference laboratory for antibody identification and further workup.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Negi G, Malhotra S, Meinia SK, Kaur D, Rai D. Adding further evidence for clinically significant anti-Le^b antibody in a voluntary blood donor. *Asian J Transfus Sci* 2020;14:198-9.

Department of Transfusion Medicine, All India Institute of Medical Sciences, Rishikesh, ¹Department of Transfusion Medicine, Post Graduate Institute of Medical Education and Research PGIMER, Chandigarh, ²Fatima Hospital, Gorakhpur, Uttar Pradesh, India

Address for correspondence:

Dr. Sheetal Malhotra,
Department of Transfusion Medicine, Post Graduate Institute of Medical Education and Research PGIMER, Chandigarh, India.
E-mail: sheetalpgi2007@yahoo.com

Submitted: 22-06-2019

Revised: 24-12-2019

Accepted: 12-04-2020

Published: 19-12-2020

Results

A 19-year-old male, the first time donor donated blood in our department of transfusion medicine. There were no relevant histories of any recent infection or any chronic disease, transfusion, or drug intake. Blood group performed in IH laboratory showed B RhD positive by forward (cell) grouping by CTT. In reverse (serum) grouping, there was agglutination (1+) with pooled group O red cells. The indirect antiglobulin test (IAT) was positive (2+ and 3+ by CTT and CAT respectively) while direct antiglobulin test (DAT) and auto-control were found to be negative.

The results from the reference laboratory confirmed his blood group to be B RhD positive and the alloantibody in his plasma was identified as anti-Le^b, having clinically significant features, reactive at the broad thermal amplitude of 22°C–37°C. IgM and IgG antibody titers of anti Le^b were 2 and 4, respectively, by CAT. Donor's RBCs were typed as Le^b negative. The most frequent alloantibodies (0.13%) identified among alloimmunized blood donors in our center, were of Lewis blood group system (14/10,390).

Discussion

Antibodies in the Lewis blood group system are capable of activating complement and occasionally cause *in vivo* and or *in vitro* hemolysis.^[4] Study by Thakral *et al.* has demonstrated the frequency of Le (a+b-), Le(a-b+), and Le(a-b-) in the Indian population to be 20.8%, 60.6%, and 18.6%, respectively.^[5] Similarly, Nanu and Thapliyal found the frequency to be 13.3%, 61.0%, and 23.9%, respectively.^[6] In the majority of cases, Lewis antibodies are naturally occurring, however, sometimes RBC transfusion may stimulate their production. Promwong *et al.* studied alloantibodies in the donor population where they found a frequency of anti-Le^b to be 18.9%.^[7] Keokhamphoui *et al.* found it to be 0.42%.^[8] Garg *et al.* and Makroo *et al.* found these frequencies to be 2.1% and 1.31%, respectively.^[9,10] The prevalence of anti-Le^b among our donor population was found to be 0.13%.

Antibodies to Lewis blood group system are rarely clinically significant. In this case, there was a naturally occurring alloanti Leb identified in the donor's plasma with both IgM and IgG components,, having a broad thermal amplitude (22°C–37°C), thereby making it clinically significant. Since in this particular case, anti-Le^b was IgM and IgG in nature, it was clinically significant and can lead to hemolytic transfusion reaction, especially if such fresh frozen plasma unit is transfused to Le^b negative patients. A special IH report indicating the presence of alloanti Le^b in his plasma with an advice

to transfuse B RhD positive, Le^b antigen negative AHG (anti human globulin) phase crossmatch compatible red cells in case any such need arises in future as well as to refrain from further blood donations.

Conclusion

Screening for the presence of alloantibodies in donated blood is a vital step to provide compatible blood to the recipients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Fung MK, Grossman BJ, Hillyer CD, Westhoff CM, editors. ABO, H, and Lewis Blood Groups and Structurally Related Antigens. In: Technical Manual. 18th ed. Bethesda, USA: AABB; 2014. p. 305-6.
2. Spitalnik S, Cowles J, Cox MT, Blumberg N. Detection of IgG anti-Lewis(a) antibodies in cord sera by kinetic Elisa. *Vox Sang* 1985;48:235-8.
3. Mollison PL, Engelfriet CP, Conteras M. The Rh blood group system. In: Blood Transfusion in Clinical Medicine. 9th ed. Oxford: Black well Scientific Publication; 1993. p. 2008-9.
4. Leger RM. Blood group terminology and other blood groups. In: Harmening DM, editor. Modern Blood Banking and Transfusion Practices. 6th ed. USA: F.A. Davis; 2012. p. 172-215.
5. Thakral B, Saluja K, Sharma RR, Marwaha N. Phenotype frequencies of blood group systems (Rh, Kell, Kidd, Duffy, MNS, P, Lewis, and Lutheran) in north Indian blood donors. *Transfus Apher Sci* 2010;43:17-22.
6. Nanu A, Thapliyal RM. Blood group gene frequency in a selected north Indian population. *Indian J Med Res* 1997;106:242-6.
7. Promwong C, Siammai S, Hassarin S, Buakaew J, Yeela T, Soisangwan P, *et al.* Frequencies and specificities of red cell alloantibodies in the Southern Thai population. *Asian J Transfus Sci* 2013;7:16-20.
8. Keokhamphoui C, Urwijitaroon Y, Kongphaly D, Thammavong T. Red cell alloantibodies in Lao blood donors. *Southeast Asian J Trop Med Public Health* 2014;45:194-7.
9. Garg N, Sharma T, Singh B. Prevalence of irregular red blood cell antibodies among healthy blood donors in Delhi population. *Transfus Apher Sci* 2014;50:415-7.
10. Makroo RN, Rajput S, Agarwal S, Chowdhry M, Prakash B, Karna P. Prevalence of irregular red cell antibody in healthy blood donors attending a tertiary care hospital in North India. *Asian J Transfus Sci* 2018;12:17-20.